SENATE COMMITTEE ON APPROPRIATIONS
Senator Sabrina Cervantes, Chair
2025 - 2026 Regular Session

SB 1350 (McNerney) - Energy: renewable electrical generation facilities: definition

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Urgency: No
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Policy Vote: E., U. & C. 15 - 0, E.Q. 7 - 0
Mandate: Yes
Consultant: Ashley Ames

Bill Summary: This bill would expand the definition of "renewable electrical generation facility" to include facilities converting hydrogen gas to electricity in a turbine that meet specified criteria, thereby allowing them to qualify for the Renewable Portfolio Standard (RPS).

Fiscal Impact:
- The California Energy Commission (CEC) estimates ongoing costs of $777,000 annually (Energy Resources Program Account [ERPA]) for 4 positions to (1) provide project technical analysis, program guidelines development, staff process creation and facility eligibility determinations in the RPS program, (2) undertake reporting, data collection and analysis from energy data of facilities using eligible renewable fuels, and (3) review petitions to amend and modify existing licenses to incorporate hydrogen fuel into a project's fuel supply, among other things.

Background: The Renewable Portfolio Standard (RPS) requires all load-serving entities (LSEs) in California to procure a portion of their electricity sales from eligible renewable resources. The procurement goal was updated by SB 100 (de León, Chapter 312, Statutes of 2018) to 60% of energy procured by LSEs be from eligible renewable energy resources by 2030. The California Public Utilities Commission (CPUC) and CEC jointly implement the RPS program. The CEC certifies facilities that generate renewable energy as eligible for the RPS. The CEC's RPS certification of a facility means the facility can generate electricity that may be used by a retail seller or publicly owned utility (POU) to satisfy its RPS procurement requirements.

According to the Legislative Analyst's Office (LAO), RPS is likely a substantial driver of emission reductions at a moderate cost per ton. The LAO estimates that the RPS program (1) reduced annual emissions by up to the low tens of millions of tons in 2018 and (2) costs about $60 to $70 per ton reduced in energy procurement costs. A variety of other costs—such as transmission and integration costs—are difficult to quantify, but could increase costs by tens of dollars per ton. Although the program likely generated other benefits— such as reducing local air pollutants and contributing to a global decline in solar prices—the magnitude of these effects appears to have been relatively small. Importantly, future costs to increase renewable generation are likely to be much different than past costs. This is because procurement costs for renewable energy are likely to be much lower in the future due to declining renewable prices, but this could be at least partially offset by higher integration costs.

Direct IOU Compliance Costs Likely Over $1 Billion Annually—Roughly 5 Percent of Total Costs. State law requires CPUC to report annually on IOU RPS procurement and generation costs, increases in total utility costs from meeting RPS requirements, and avoided costs as a result of meeting RPS. In total, CPUC estimates 2018 RPS procurement expenditures for the three large IOUs were $1.1 billion higher than alternative sources of electricity generation (the cost of a combined cycle natural gas power plant). Although this estimate is imperfect, it provides a rough sense of the RPS's higher generation costs. For context, the large IOUs collect about $24 billion in annual revenue from "bundled" customers—or customers for whom the IOU procures the energy, as well as the distribution and transmission. The $1.1 billion in costs reflects an almost 5 percent increase in overall retail rates for bundled IOU customers. This increase is generally consistent with national studies that have found increased rates from RPS of about 3 percent to 8 percent.

Cost and benefits of RPS. An article appearing the Environmental Research Letters titled "Assessing the Costs and Benefits of US Renewable Portfolio Standards" found that at the national-level, the monetized value of improved air quality and reduced climate damages for RPS programs exceed the increase electric system costs. The same study found that existing RPS policies yield $97 billion in air-pollution health benefits and $161 billion in climate damage reductions. These scenarios also yield benefits in the form of reduced water use.

Effective decarbonization using hydrogen depends on a number of factors. Certain sectors are increasingly advocating for the use of hydrogen as a fuel to displace more fossil-intense fuels; however, the ability to achieve emissions reductions and effectively decarbonize certain processes by using hydrogen depends on a variety of factors, including the feedstocks and processes used to make hydrogen and the amount of hydrogen displacing fossil fuel. Currently over 90% of the hydrogen used in the United States is produced from fossil fuels – specifically, through steam methane reforming (SMR). Even electrolytic hydrogen has the potential to increase emissions from the power sector by relying on electricity produced from fossil fuel to make the hydrogen through electrolysis of water. Hydrogen is also a smaller, less energy dense molecule than the methane compounds in natural gas. As a result, turbines using a blend of natural gas and hydrogen may need to burn more fuel to produce the same amount of combustion power as traditional natural gas turbines. At low blends of hydrogen and natural gas, this need for more fuel can increase a facility's use of natural gas despite using a blend with hydrogen. Hydrogen blends also require much higher blends of hydrogen to meaningfully achieve emissions reductions. Research from the National Renewable Energy Laboratory (NREL) indicates that blends of 20% hydrogen and natural gas can only achieve up to a 6 to 7% reduction in GHG emissions. Turbines for electrical power generation may also need to use solely natural gas to facilitate "cold" starts and stops for turbines that are not consistently running, which can lower the anticipated emissions savings from using hydrogen blends in these turbines.

The "three pillars" of clean hydrogen development. The development of the 45v tax credit elevated a debate about the extent to which hydrogen producers are capable of complying with certain clean hydrogen requirements, including requirements to prevent the shifting of emissions to the electricity sector. As part of the development of the 45v tax credit, the federal Treasury Department released a draft proposal for the tax credit, which included setting requirements for hydrogen to meet a set of principles known as

the “three pillars.” These principles are intended to ensure that hydrogen production supports decarbonization and does not result in an increase in emissions. The three pillars include the following requirements:

- Additionality/Incrementality: the hydrogen must be produced from new units of renewable electric generation to prevent hydrogen from diverting clean energy resources away from the grid.

- Deliverability: the hydrogen must be regionally deliverable to ensure that the hydrogen is not being produced from dirty resources that cannot be verified or from far away resources that are never able to reach the facility.

- Hourly Matching: the hydrogen’s production must match a clean power supply on an hourly basis to ensure that hydrogen production does not increase demand for fossil fuel generation.

Proposed Law: This bill would make certain facilities converting hydrogen gas to electricity in a turbine eligible for the RPS by adding these facilities to the definition of “renewable electrical generation facility.”

Existing law defines a “renewable electrical generation facility” as a facility that uses biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation of 30 megawatts (MW) or less, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current. To meet the definition of a renewable electrical generation facility, the facility must be in state, have its first point of connection to the transmission network of a balancing authority area primarily located within the state, or has its first point of interconnection to the transmission network outside the state, within the Western Electricity Coordinating Council (WECC) and meets certain specified requirements. (Public Resources Code §25741)

This bill would add to that definition that a facility can meet either that existing criteria or of the following criteria:

1. The facility converts hydrogen gas to electricity in a turbine and meets all of the following criteria:
    a. The hydrogen used in the turbine is solely derived from a non-fossil-based feedstock or through the electrolysis of water using electricity generated from another renewable electrical generation facility.
    b. The electricity used to derive the hydrogen is not also counted toward a compliance obligation pursuant to the California Renewables Portfolio Standard Program (Article 16 (commencing with Section 399.11) of Chapter 2.3 of Part 1 of Division 1 of the Public Utilities Code) or claimed as renewable generation for any other state program.
    c. The facility’s turbine has the capacity to use a fuel for which hydrogen comprises a sufficient quantity of the blend by volume, as determined by the commission, but not below 20 percent by volume, to achieve a measurable reduction in greenhouse gas emissions, as determined by the commission.

d. The operator of the facility has submitted information on the hydrogen production process, as specified by the commission.

e. The manufacturing of the hydrogen does not result in resource shuffling, as determined by the State Air Resources Board, in alignment with existing regulations.

f. The manufacturing of the hydrogen does not use unbundled renewable energy credits.

g. The use of the hydrogen results in a net decrease of air pollutants, as regulated by local air districts, and of greenhouse gases from the electrical sector.

Related Legislation:

SB 993 (Becker) of 2024, would have required the CPUC, after making certain findings, to establish a tariff to encourage new, grid-responsive electricity consumption exclusively for electrolytic hydrogen production and electrifying industrial heat processes. The bill was held in this committee.

SB 1018 (Becker) of 2024, would have exempted sellers of wind and solar generation from the definition of an “electrical corporation” if that generation is transmitted over private lines for electrolytic hydrogen production or industrial heat processes. The bill was held in the Assembly Appropriations Committee.

SB 1420 (Caballero, Chapter 608, Statutes of 2024) expanded the types of facilities eligible for opt-in permitting administered by the CEC to include hydrogen production facilities that do not use fossil fuel feedstocks and also receive funding from certain state and federal programs. The bill also limited the opt-in permitting eligibility of projects that combust biomass.

SB 663 (Archuleta) of 2023, would have defined renewable hydrogen and added renewable hydrogen as a renewable energy resource under the RPS. The bill would also have established criteria for renewable hydrogen acquired from a dedicated or on-site pipeline to meet RPS standards. The bill died in the Senate.

AB 1550 (Bennett) of 2023, would have established a clean fuel requirement for all hydrogen produced or used in California for electrical generation or vehicle refueling, starting on January 1, 2045. The bill’s clean fuel standard would have required all hydrogen to be "renewable hydrogen of biological origin" or "renewable hydrogen of nonbiological origin," as specified. The bill would have added renewable hydrogen of biological origin and renewable hydrogen of nonbiological origin to the list of RPS-eligible resources. The bill died in the Assembly.

SB 1075 (Skinner, Chapter 363, Statutes of 2022) required CARB and the CEC to analyze options for using hydrogen as part of decarbonization strategies.

AB 157 (Committee on Budget, Chapter 570, Statutes of 2022) authorized GO-Biz to take steps to prepare and submit an application to receive funding from the regional

clean hydrogen hubs program or to otherwise participate in the regional clean hydrogen hubs program. The bill also established a definition of clean hydrogen.

AB 209 (Committee on Budget, Chapter 251, Statutes of 2022) among other provisions, establishes a hydrogen funding program at the CEC to support projects that produce, process, deliver, store, or use hydrogen.

Staff Comments: The CEC estimates ongoing costs of $777,000 annually as a result of this bill. Of this amount:

- The CEC estimates ongoing costs of $371,000 annually (ERPA) for direct bill implementation. The CEC estimates that adding renewable hydrogen into RPS for the limited purpose of this bill, and ongoing RPS program administration, will require incremental resources for 2 two positions. These positions would provide project technical analysis, program guidelines development, staff process creation and facility eligibility determinations in the RPS program. This also includes reporting, data collection and analysis from energy data of facilities using eligible renewable fuels.

- The CEC estimates ongoing costs of $406,000 annually (ERPA) due to secondary impacts that would result in direct costs The CEC anticipates that SB 1350 would lead owners and operators of existing natural gas power plants in California to seek modifications to their facilities to accommodate the onsite storage and combustion of renewable hydrogen. Under the Warren-Alquist Act, the CEC has exclusive jurisdiction over thermal power plants in California of at least 50 MW, subject to certain limitations. If jurisdictional power plants were repurposed and redesigned to operate using renewable hydrogen, the facilities would need to seek CEC approval of amendments to their operating licenses. With SB 1350 potentially causing more power plants retrofits to operate using renewable hydrogen, the CEC anticipates that there would be additional staff resources needed to fulfill the potential increase in power plant certification. To support the work necessary to review petitions to amend and modify existing licenses to incorporate hydrogen fuel into a project's fuel supply the CEC would need two positions for technical analysis. This analysis would include environmental impact reviews to disclose potential impacts consistent with the California Environmental Quality Act (CEQA).

Staff notes that ERPA is in a structural deficit, an issue that's been both recurrent and long-standing. The state uses ERPA funds to support various energy programs and projects, including CEC's operations. ERPA is funded primarily by a surcharge on retail electricity sales, which is currently set to the statutory maximum of $0.0003 per kWh. This surcharge generated $71.6 million in 2022-23. On average, a California ratepayer pays about 16 cents per month for the surcharge—or about $2 annually. The CEC sought authority to increase this tax via a budget trailer bill in 2024 but was unsuccessful. Any increased expenditures from this account would exacerbate this deficit and expedite the insolvency of the fund.

Concerns about cost-effectiveness. As discussed in the background, California's RPS program is likely a substantial driver of emission reductions at a moderate cost per ton. Furthermore, substantial environmental and health benefits have been evidenced and attributed to RPS, such as improved air quality and reduced water usage. The

monetized value of these benefits is sizeable and clearly outweigh the costs for RPS. For example, the above study found that existing RPS policies yield $97 billion in air-pollution health benefits and $161 billion in climate damage reductions. Suffice it to say that California's RPS is fairly cost-effective when it comes to state policy goals.

SB 1350 would allow for the combustion of hydrogen in a natural gas blend to generate RPS-eligible electricity. Blends of hydrogen and natural gas can vary from very low blends comprised almost entirely of natural gas and very high blends of hydrogen with very little natural gas. This bill does not clarify that a turbine must primarily use hydrogen in order to qualify as an RPS-eligible resource. As a result, this bill may enable natural gas plants to obtain RPS eligibility by using very little renewable fuels. Since GHG emissions reductions from a powerplant using hydrogen blends can only be achieved when those blends contain a larger percentage of hydrogen, powerplants using low blends of hydrogen with natural gas may not meaningfully reduce emissions from those facilities through the use of hydrogen. To the extent that facilities using these low blends of hydrogen obtain renewable energy credits, they may be obtaining credits for power that fails to reduce emissions from the power sector and continues to primarily use fossil fuel.

Other air pollutants are also a concern, particularly given the facts that burning hydrogen has the potential to produce significant volumes of oxides of nitrogen (NOx), that NOx are a major contributor to smog formation in the very same highly-NOx-polluted air basin where two existing facilities reside, and that simply ensuring a 20% blend of hydrogen does not address this issue, it may be necessary to add more guardrails onto the burning of hydrogen in these blends.

Expanding RPS eligibility to incorporate a much lower standard for facilities could lower the program's cost-effectiveness, thereby increasing costs or reducing benefits relative to current outcomes. This could result in state costs to the extent that the state backfills foregone GHG emission reductions or increases spending on air quality, water conservation, or other goal.

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